LEED
LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

# LEED-EB Project Case Study:
# *JohnsonDiversey Headquarters*

***CONTENTS***

A case study is a valuable tool that others can use as a model for implementing LEED-EB. This case study documents the approach taken in a specific organization and building. It offers insights on getting an organizational commitment to pursue LEED-EB certification, managing a project, the costs and benefits of particular actions, the problems that may arise, and the solutions that can be used to address those problems.

These case studies show that LEED-EB can be successfully implemented in real buildings. Use the information in this document to demonstrate to others within your organization that LEED-EB actions are feasible for your building, because they have proven feasible in others.

The JohnsonDiversey facility is a corporate owned building that was recently constructed with sustainability in mind. It is located in a suburban/rural setting. The extent to which this case study is applicable to other projects depends upon how well the characteristics of the organization and building featured match up with your organization and building.

As you consider LEED-EB for your own organization and building, keep in mind that LEED-EB is designed to be a flexible rating system that can be applied to the unique circumstances of individual buildings. Ultimately, the best information for guiding your project will come from your and others' knowledge of your organization, building, and the LEED-EB Rating System.

### *Introduction to JohnsonDiversey*

JohnsonDiversey is a privately held, family-managed company that produces commercial cleaning and hygiene products. Founded in 1886 by Samuel Curtis Johnson, the company was initially in the business of installing wood parquet flooring. In response to customers' questions about caring for their new wood floors, Samuel Johnson's company developed Johnson's Wax. The company continued to expand and now produces a number of household products. It operates in 60 countries around the world.

### History of Sustainability

The Johnson family has a long history of emphasizing sustainability in the operations of their company. Evening during the early years of operation, sustainability was a priority. H.F. Johnson took a historic flight in 1935 to Brazil in order to study the sustainability of carnuaba palms. His efforts resulted in the establishment of a carnuaba palm plantation that provided a sustainable raw material resource for Johnson Wax products. The Johnson family's sensitivity to the environmental continued through the 20th centure, and in the 1970s, SC Johnson Wax voluntarily eliminated the use of all CFCs in their aerosol products. This leadership lead them to develop new technology, setting the stage for a legislative ban on CFCs, which as passed in the late 1970s. Their legacy of sustainable business practices continues. JohnsonDiversey has made a commitment to the ongoing development of products and programs that earn environmental certification, environmentally responsible manufacturing, engagement in global environmental dialogue, and leadership in new sustainable programs such as LEED-EB.

### LEED-EB Certified Building

JohnsonDiversey's global headquarters, located in Sturtevant, Wisconsin, is a three-story mixed-use facility constructed in 1997. The building floor area is 277,440 square feet, of which 70% is office space and 30% is research laboratories. The building was designed based on green-building principles, including high-energy efficiency, extensive use of natural lighting, and individual control of workspace environments. Because it was built with sustainability in mind, applying LEED-EB to the building was primarily a matter of fine-tuning the building's operations practices and improving the documentation of existing sustainable practices. The JohnsonDiversey Global Headquarters was certified LEED-EB Gold in March, 2004.

***Cultivating an Organizational Commitment to LEED-EB***

JohnsonDiversey's interest in LEED-EB came about as a result of ongoing discussions with their maintenance subcontractor, Johnson Controls, about the LEED for New Construction (LEED-NC) program. The JohnsonDiversey Headquarters was completed just before LEED-NC became available to the public.

Johnson Controls advocated for LEED certification from the start of their relationship with JohnsonDiversey. The building was built with sustainability principles integrated into its design and construction, but Stu Carron, Director of Global Facilities and Real Estate, determined that LEED-NC certification simply did no fit JohnsonDiversey's organization goals, nor did it reflect its operation practices adequately. The development and availability of the LEED-EB Pilot Program opened a new door for JohnsonDiversey to participate in a LEED program.

LEED-EB represented a logical, sustainable approach to building operations that "made total sense" for JohnsonDiversey. Realizing the linkages between JohnsonDiversey's business and LEED-EB certification, Carron believed that EB not only fit the Headquarters building exceptionally well, but it also made business sense. Because many of JohnsonDiversey's products are environmentally friendly and can be used to meet a number of LEED-EB Rating System standards, LEED offers JohnsonDiversey a long-term business growth opportunity.

Carron took the lead in presenting LEED-EB to senior management by developing a white paper that analyzed LEED-EB and its potential impacts on JohnsonDiversey and the marketplace. As he puts it, his paper was intended to demonstrate "Here's what USGBC is, here's the program, here's the growth and potential impact; We need to get involved in the pilot."

JohnsonDiversey agreed that LEED-EB offered an important opportunity. Carron describes the company's motives for pursuing LEED-EB:

> JohnsonDiversey's commitment to LEED for Existing Buildings is a product of our clear understanding of the many benefits that LEED-EB offers our company, employees, and stakeholders. Achieving LEED-EB certification not only publicly illustrated our commitment to reducing environmental impacts and to ensuring the health of our workplace, it affirms our corporate interests in pursuing sustainable business practices for the future. LEED-EB certification has helped us identify significant cost savings as well as opportunities to reduce the environmental impacts of our building operations.

## Assembling Teams

Stu Carron's 'white paper' describing LEED-EB solidified the support of senior management at JohnsonDiversey. The next critical step was working with Johnson Controls to enlist a LEED Accredited Professional (LEED AP) to assist in the certification process. The LEED AP, Jeff Furness, reviewed facility operations and practices for a preliminary LEED-EB scoring of the facility. Based on his review, Furness and Carron identified the most achievable and cost-effective opportunities for change, and developed a list of recommendations for achieving LEED-EB Prerequisites and Credits.

Using this recommendation as a strategic road map, Carron assembled his project team. Because JohnsonDiversey outsources almost all of it's facility management, maintenance, and cleaning tasks, this team included key contractors from those elements of the operations team.

The project team responded enthusiastically to Carron's plan to achieve LEED-EB certification. As longtime partners with JohnsonDiversey, the subcontractors were committed to meeting JohnsonDiversey's needs and operational priorities. Each team member was assigned a set of Credits to document and work towards, and asked to work closely with Stu Carron as challenges and opportunities arose. The contractors were motivated to meet LEED-EB goals to maintain their successful relationship with JohnsonDiversey, and also because, according to Carron, "These are individuals who genuinely want to do the right thing."

## Identifying Green Starting Points

Green starting points are sustainable practices and building features that are already in place or could be easily modified to meet LEED-EB requirements. These starting points provide the foundation onto which additional sustainability measures can be adopted. As Furness's preliminary analyses illustrated, JohnsonDiversey benefited from already having in place many of the building design features and operating practices required by LEED-EB. Few organizational changes were required, so that JohnsonDiversey did not have to change the basics of how they did business.

## Implementing Changes

The most significant challenge for JohnsonDiversey in establishing ongoing LEED-EB implementation has been institutionalizing the business practices and systems required by the program. For many employees, documenting activities and reporting on the status of projects represented a new responsibility. The challenge for Stu Carron has been integrating those new responsibilities into job descriptions and the daily lives of his team. Equally critical has been keeping his staff and contractors motivated and committed to the shared goal of maintaining LEED-EB standards.

## Plans for Recertification

JohnsonDiversey is focused on maintaining the present level of success of their LEED-EB program and to finding ways to seamlessly integrate LEED-EB requirements and practices into their daily operations. Key is keeping employees and contractors motivated to seek efficiencies and management approaches to assist in that integration. As Carron notes, "It's tempting for people to say 'We've got the certification, let's move on to the next thing.' But it's part of my job to embed LEED-EB into systems and processes so it becomes a long-term part of our operations. This is a way of life now at JohnsonDiversey, not something we want to put behind us."

Looking to the future, JohnsonDiversey's emphasis remains on operationalizing and maintaining their current programs to ensure smooth recertification. At the same time, Carron is identifying opportunities for the future to supplement their program and earn additional points. Long-term planning for equipment replacements or alterations to the building are viewed as chances to pursue and achieve additional LEED-EB Credits.

Carron intends to maintain his current project team for ongoing implementation, making use of their experience with LEED-EB and their awareness of its operational requirements and principles. The team meets every six weeks to discuss LEED-EB related issues and challenges, and to plan for future opportunities. Individual team members retain responsibility for the ongoing achievement and monitoring of their respective Credits, as well as the support of the group in addressing new or unforeseen obstacles.

The key motivator for Carron and his team is achieving success in the eyes of their customers – the occupants of their buildings. JohnsonDiversey believes that LEED-EB certification is a big part of improving workplace productivity, and intends to measure that with a series of employee and occupant surveys. Achieving occupant satisfaction is the benchmark by which company success is measured.

## Narrative Summary of Benefits

By Stu Carron, Global Facility Manager JohnsonDiversey

Participating in LEED-EB and achieving LEED-EB certification has produced a number of benefits for our company:

- Energy savings exceed $90,000 per year, relative to a similar building designed without integrated design approach and energy efficiency measures.
- Use of collected stormwater for turfgrass irrigation reduces potable water use by 2-4 million gallons per year.
- For the first time, we have documented that over 50% of site generated solid waste is recycled.
- Participation in the LEED-EB program has renewed focus on integrated pest management, cleaning worker training, certified cleaning chemicals, systems approach to cleaning, and cleaning equipment, and has allowed JohnsonDiversey to construct an integrated cleaning program in alignment with LEED requirements.
- $CO_2$ monitoring has confirmed adequate airflow design in occupied building areas, and allows us to respond to unusual incidents or conditions.
- Individual/personal environment controls (air flow, temp, acoustics and lighting) significantly increase occupant comfort, virtually eliminate hot/cold calls to maintenance, and allow for general building zone temperature range to exceed normal building comfort ranges thereby resulting in additional energy savings.
- Occupant interest and involvement in environmental aspects of building operation have increased.

## Economic Summary of Benefits

| | |
|---|---|
| Building floor space | 277,440 $ft^2$ |
| Initial Implementation Cost | $73,800 |
| Initial Implementation Cost per $ft^2$ | $0.27 |
| Annual Net Savings | $137,320 |
| Annual Net Savings per $ft^2$ | $0.49 |
| Life Cycle Net Present Value* | $1,351,535 |
| Life Cycle Net Savings per $ft^2$ | $4.87 |
| ROI | 0.5 years |

***Credit by Credit Analyses***

The pages that follow provide an analysis of how JohnsonDiversey addressed Prerequisites and Credits they earned. This includes a description of their actions, the financial costs and benefits of the action, any challenges that arose as they implemented the action, and their plan to continue carrying out this action in the future.

Though this document will primarily be used by those obtaining certification through the Post-pilot Version, JohnsonDiversey earned LEED-EB certification under the Pilot Version. Prerequisites and Credits will be presented with their Post-pilot Version names, with Pilot Version names noted when different.

Notes about Economic Data:

- Life Cycle Net Impact is based on life cycle length of 15 years and a 5.0% interest rate
- Financial data is specific to the case study project, and is based on actual costs or savings and/or best estimates as determined by project representatives

## Index to Featured Prerequisites and Credits

* Indicates the name of this Prerequisite or Credit is different in the Post-Pilot Version of LEED-EB than in the Pilot Version of LEED-EB. Names listed are based on the Post-Pilot Version.

**Indoor Environmental Quality**



**Innovations in Upgrades, Operations and Maintenance**

# *Sustainable Sites*

## **Prerequisite 1:** Erosion & Sedimentation Control

Required

**Intent**

Control erosion to reduce negative impacts on water and air quality.

**Status:** Earned

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ 0.02 cost |

**Measures Supporting Achievement**

JohnsonDiversey has adopted a site sedimentation and erosion control plan that confirms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-833-R-92-001, Chapter 3. As part of their efforts to prevent soil loss from the site caused by storm water runoff and/or wind erosion during landscaping or building improvements, JohnsonDiversey has committed to adherence to the policy for all construction projects in the building and on the site.

The plan summarizes the critical elements necessary to effectively minimize erosion during building site projects. These elements include specifications for strategies, materials, work plans, and inspections of the site. The plan includes extensive details on each item that is to be employed, designating the specific materials, sizes, types, etc.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the actions needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to follow the site sedimentation and erosion control plan on an ongoing basis to preserve the site, protect water quality, and to support ongoing recertification under LEED-EB.

# *Sustainable Sites*

## **Credit 1.1-1.2:** Plan for Green Site and Building Exterior Management*

Points Available: 2

*SS Credit 9.1-9.2 in LEED-EB Pilot Version

**Intent**

Encourage grounds/site/building exterior management practices that have the lowest environmental impact possible and preserve ecological integrity, enhance diversity and protect wildlife while supporting building performance and integration into surrounding landscapes.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ 0.04 cost |

**Measures Supporting Achievement**

JohnsonDiversey's facility has maintained a significant amount of open space, vegetated ground, native ground, and adapted ground cover that provides viable habitats for local wildlife. Ponds and wetlands totally 15 acres provide habitat for a variety of \ waterfowl and marine life. Prairie Nursery, Inc. monitors the health and growth of the prairie grasses, wild flowers, and native landscape on the site, providing annual written assessments and improvement recommendations. In addition, JohnsonDiversey has developed and adopted a low impact site and building exterior chemical/fertilizer/pest management program in summer and low impact snow removal and management program in winter.

**Challenges & Solutions for Achievement**

JohnsonDiversey was able to develop a policy specification that incorporated LEED-EB principles and requirements; facility management contractors were required to reflect LEED-EB compliance steps in their revised scopes of work.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

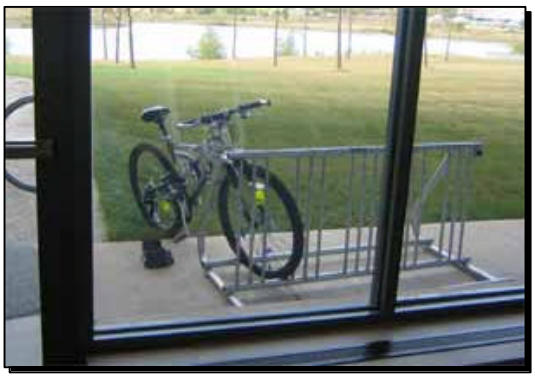
JohnsonDiversey plans to maintain its extensive natural wildlife habitats by continuing to monitor and maintain of vegetation, the health of the pond, and general vitality of the site. Monitoring will include seasonal migratory bird counts and catch-and-release fishing program reports.

# *Sustainable Sites*

## **Credit 3.2:** Alternative Transportation - Bicycle Storage & Changing Rooms*

Points Available: 1

*SS Credit 4.2 in LEED-EB Pilot Version



**Intent**

Reduce pollution and land development impacts from automobile use.

**Status: Earned 1 point**

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 cost |

**Measures Supporting Achievement**

JohnsonDiversey maintains facilities to securely house at least 30 bicycles in 3 racks located at ground level of the West Side of the 655-person facility. Convenient changing and shower facilities are located nearby and next to the fitness center for cyclists' use. Monthly checks of the number of building occupants and quarterly checks of the facilities are conducted and documented to verify that the bike securing apparatus and changing and shower facilities are sufficient to serve at least 5% of the buildings' occupants.

**Challenges & Solutions for Achievement**

Communicating policies and programs to building occupants was the most significant challenge related to this Credit. JohnsonDiversey has added information to the corporate intranet as well as the Building Occupant Guide (the 'homeowners' manual' for their facility) to inform employees and encourage use of the facilities.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain adequate bicycle racks and shower facilities to encourage building occupants to commute to work by bicycle and to support ongoing recertification under LEED-EB.

# *Sustainable Sites*

## **Credit 3.3:** Alternative Transportation - Alternative Fuel Vehicles*

Points Available: 1

*SS Credit 4.3 in LEED-EB Pilot Version

**Intent**

Reduce pollution and land development impacts from automobile use.

**Status: Earned 1 point**

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 cost |

**Measures Supporting Achievement**

JohnsonDiversey's parking facility has a total vehicle capacity of 580 cars. JohnsonDiversey provides up to 58 spaces of preferred parking for hybrid or alternative vehicles, accounting for 10% of total vehicle parking capacity. The spaces are located on the northwest corner next to the building and adjacent to the center sidewalk. Monthly checks are conducted and documented to verify that the hybrid and alternative fuel vehicle preferred parking represents at least 10% of the parking capacity.

**Challenges & Solutions for Achievement**

Communicating policies and programs to building occupants was the most significant challenge related to this credit. JohnsonDiversey has added information to the corporate intranet as well as the building occupant guide (the 'homeowners' manual' for the facility) to inform employees and encourage use of the facilities.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain adequate preferred parking for hybrid and alternative vehicles to encourage building occupants to commute to work in hybrid and alternative vehicles and to support ongoing recertification under LEED-EB. An active communication and registration program with appropriate recognition will encourage building occupants to consider alternative vehicles when making their buying decisions.

# *Sustainable Sites*

## **Credit 3.4:** Alternative Transportation - Car Pooling & Telecommuting*

Points Available: 1

*SS Credit 4.4 in LEED-EB Pilot Version

**Intent**

Reduce pollution and land development impacts from single occupancy vehicle use.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 cost |

**Measures Supporting Achievement**

JohnsonDiversey is providing up to 16 carpool/vanpool spaces at this facility and is encouraging the use of car/vanpools by building occupants.

**Challenges & Solutions for Achievement**

Communication policies and programs to building occupants was the most significant challenge related to this credit. JohnsonDiversey has added information to the corporate intranet as well as the building occupant guide (the 'homeowner's manual for the facility) to inform employees and encourage use of the facilities.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain adequate preferred parking for carpool/vanpool vehicles to encourage building occupants to commute to work in carpool/vanpools and to support ongoing recertification under LEED-EB. An active communication and registration program with appropriate rewards will encourage building occupants to consider alternative transportation for commuting.

# *Sustainable Sites*

## **Credit 4.1-4.2:** Reduced Site Disturbance - Protect or Restore Open Space*

Points Available: 2

* SS Credit 5.1-5.2 in LEED-EB Pilot Version

**Intent**

Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

**Status:** Earned 2 points

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 cost |

**Measures Supporting Achievement**

Building 200 is located on a rural site measuring 2,501,943 $ft^2$. Total vegetated area of the site including turf grass, prairie grass, and ponds equals 2,081,688 $ft^2$, or 93% of the total open space. If ponds are excluded from this calculation, total vegetated area equals 1,732,022 sq.ft. or 77% of total open space. JohnsonDiversey has hired Prairie Nursery, Inc., of Westfield, Wisconsin to monitor the growth and health of native or adapted vegetation such as prairie grasses, wildflowers and native landscaping. A minimum assessment along with improvement recommendations is to be provided annually.

**Challenges & Solutions for Achievement**

Properly vegetating this site has been an ongoing project since construction was completed in 1997. After extensive site disturbance during construction, efforts to restore native vegetation were frustrated by failed plantings and difficulties containing invasive species. JohnsonDiversey was eventually able to identify a consultant with extensive knowledge of regional native species and appropriate planting and maintenance techniques.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

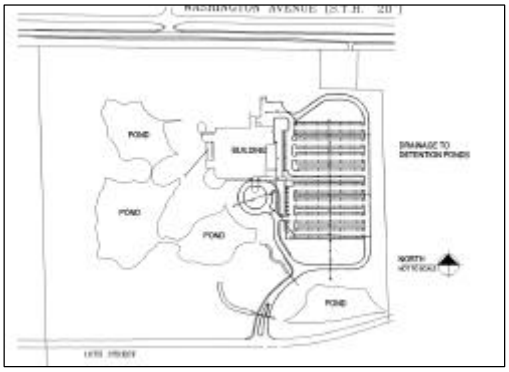
Once established, the vegetation is largely self-sustaining. JohnsonDiversey's consultant performs annual checks to ensure invasive species are not infringing on the site. JohnsonDiversey plans to closely monitor and observe the health of the native plantings and vegetation that has been integrated on the site, and take steps as needed to ensure its continued health and success.

# *Sustainable Sites*

## **Credit 5.1-5.2:** Stormwater Management - Rate and Quantity Reduction*

Points Available: 1

*Credit 6.1 in LEED-EB Pilot Version




**Intent**

Limit disruption and pollution of natural water flows by managing stormwater runoff.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 cost |

**Measures Supporting Achievement**

JohnsonDiversey has a storm water management program currently in place at the Building 200 site, where 34% of the site defined as impervious area. Detention ponds collect 100% of storm water runoff from the site, as well as runoff from neighboring sites and roadways. The ponds and surrounding wetlands provide sediment, pollution and flood control.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to maintain its current stormwater management program to ensure 100% runoff collection from impervious areas. JohnsonDiversey is monitoring the operation of this system and its impacts on the site environment.

# *Water Efficiency*

## **Prerequisite 1:** Minimum Water Efficiency

Required

**Intent**

Maximize water efficiency within buildings to reduce the burden on potable water supply and wastewater systems.

**Status:** Earned

**Economic Data***

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

* See WE Credit 3 on page 22 for costs and savings associated with building water efficiency.

**Measures Supporting Achievement**

JohnsonDiversey maintains a water use fixture performance baseline that is 32% below the usage that would result from outfitting 90% of the total building fixture count with plumbing fixtures that meet the EPA Policy act of 1992 (EPACT92) fixture performance requirements.

JohnsonDiversey has completed the conversion from 2.5 gpm to 0.5 gpm by installing aerators in all lavatory faucet fixtures and has completed the conversion from 2.5 gpm to 1.8 gpm by installing aerators in all shower facilities. The toilets and urinals have replacement Sloan Valve Co. valve diaphragms rated at 1.6 gpf for toilets and .5 gpf for urinals.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain all fixtures in a manner that will continue to maximize water efficiency and ensure reduced demands on potable water supply and wastewater systems.

# *Water Efficiency*

## **Prerequisite 2:** Discharge Water Compliance

Required

**Intent**

Protect natural habitat, waterways and water supply from pollutants carried by building discharge water.

**Status:** Earned

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

The JohnsonDiversey building complex is not governed by the EPA NPDES Clean Water Act requirements.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey does not intend to make alterations to the facility that would necessitate governance by the EPA NPDES Clean Water Act.

# *Water Efficiency*

## **Credit 1.1-1.2:** Water Efficient Landscaping

Points Available: 2

**Intent**

Limit or eliminate the use of potable water for landscape irrigation.

**Status:** Earned 2 points

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.06 |
| Annual Net Impact / $ft^2$: | $ 0.02 savings |
| Life Cycle Net Impact / $ft^2$: | $ 0.18 savings |

**Measures Supporting Achievement**

The irrigation system serving the JohnsonDiversey building operates solely on captured rain and runoff from surrounding areas, using no potable water in any application. The current system used for irrigation of the grounds pumps irrigation water from the detention pond, which is supplied by captured rain and storm water runoff. The sprinkler system is automated with a timer, which can be enabled or disabled based on a moisture content analyzer reading for ground soil moisture content.

**Challenges & Solutions for Achievement**

In pursuing this Credit, JohnsonDiversey facilities management realized that it was possible to eliminate potable water use for irrigation purposes completely by making use of the water stored in onsite stormwater detention ponds. JohnsonDiversey has successfully replaced potable water with stormwater from the ponds, but it remains to be seen how effective this practice will be from a maintenance and environmental standpoint. Concerns that must be monitored for the future include the health of the pond as a wildlife and plant habitat, the maintainability of pumping equipment, and impacts to the health of irrigated areas.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain current strategies to eliminate potable water use for irrigation while monitoring this system closely for unanticipated environmental or operational impacts and to support ongoing recertification under LEED-EB.

# *Water Efficiency*

## **Credit 3.1-3.2:** Water Use Reduction

Points Available: 2

**Intent**

Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

**Status:** Earned 2 points

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.01 |
| Annual Net Impact / $ft^2$: | $ 0.01 savings |
| Life Cycle Net Impact / $ft^2$: | $ 0.13 savings |

**Measures Supporting Achievement**

JohnsonDiversey has achieved water use performance that is 32% below the baseline standards as designated by LEED-EB (consistent with EPA Policy Act of 1992 Fixture Performance Requirements) by installing aerators in all lavatory faucet fixtures and shower fixtures. The toilets and urinals have replacement Sloan Valve Company valve diaphragms rated at 1.6 gpf for toilets and .5 gpf for urinals.

JohnsonDiversey's total actual annual meter usage for 2002 was 21,032,264 gallons. The actual plumbing fixture load (1,641,900 gallons) was calculated by subtracting the process loads, the irrigation load, and the cooling tower from the meter use, and represents a reduction from a baseline of 32%.

**Challenges & Solutions for Achievement**

JohnsonDiversey was able to approach water use aggressively; facilities staff installed and tested a variety of low flow devices to reduce water volume over a three-month period. At the conclusion of testing, JohnsonDiversey was able to adopt measures that ensure they were well beyond the EPA Policy Act of 1992 standards.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain current water efficiency strategies to support ongoing recertification under LEED-EB as well as share strategies and technologies with other JohnsonDiversey facilities.

# *Energy & Atmosphere*

## **Prerequisite 1**: Existing Building Commissioning
Required

**Intent**

Verify and ensure that fundamental building systems are operating as intended to meet current needs and performance standards.

**Status:** Earned

**Economic Data**

| | | |
|---|---|---|
| Initial Cost / $ft^2$: | $ | 0.00 |
| Annual Net Impact / $ft^2$: | $ | 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ | 0.00 |

**Measures Supporting Achievement**

The JohnsonDiversey Global Headquarters building has a comprehensive building operation plan that includes constant monitoring and scheduled inspections of the heating system, cooling system, humidity control system, lighting system, safety systems, water system, and building automation system. The operation plan maintains the systems to original specifications or to specification modifications made since the building opened in 1997.

The operational plan consists of written operating procedures for the building systems and equipment, programmed logic that operates and monitors the building and safety systems, and the Measurement and Verification plan for monitoring and insuring the performance of energy and water systems in the building.

JohnsonDiversey maintains written versions of maintenance procedures and employs a preventive maintenance schedule with a computerized maintenance management system (Maximo). This system also generates work orders for maintenance and is the tracking system to ensure that the work is completed on time and as ordered. The preventive maintenance programs act as a retro-commissioning plan and program and the Facility Project Manager is the commissioning authority on site.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to continue its ongoing building commissioning activities and monitor the performance of all key building systems to support ongoing recertification under LEED-EB.

# *Energy & Atmosphere*

## **Prerequisite 2:** Minimum Energy Performance
Required

**Intent**

Establish the minimum level of energy efficiency for the base building and systems.

**Status:** Earned

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.05 |
| Annual Net Impact / $ft^2$: | $ 0.32 savings |
| Life Cycle Net Impact / $ft^2$: | $ 3.32 savings |

**Measures Supporting Achievement**

The JohnsonDiversey Headquarters is a mixed-use facility consisting of office space and research and development areas. The entire building was built to meet or exceed all applicable codes, with high efficiency ratings on the lighting and building envelope systems. Beyond these initial measures, JohnsonDiversey has enhanced the energy efficiency of the lab's mechanical systems. These measures include a heat wheel with latent and sensible energy recovery, Variable Air Volume (VAV) control for the supply fans in labs, and a common ducted exhaust system that stages and modulates six exhaust fans as required by the lab activities.

**Challenges & Solutions for Achievement**

Because the JohnsonDiversey facility has a large amount of laboratory space, it does not fall under one of the available Energy Star building types. This made it a challenge to accurately model baseline energy use for the building. JohnsonDiversey worked closely with the LEED-EB Pilot Program Committee to develop an appropriate procedure, and then had consultants build and test the model.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to continue to monitor actual energy usage to support ongoing recertification under LEED-EB.

# *Energy & Atmosphere*

## **Prerequisite 3:** Ozone Protection
Required

**Intent**

Reduce ozone depletion.

**Status:** Earned

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

JohnsonDiversey has zero use of CFC-based refrigerants in HVAC&R base building systems, ensuring full compliance with the EPA Clean Air Act, Title VI, Rule 608.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to continue to comply fully with the EPA Clean Air Act, Title VI, Rule 608 to support ongoing recertification under LEED-EB.

# *Energy & Atmosphere*

## **Credit 3.2:** Building Operation & Maintenance: Building Systems Maintenance*

Points Available: 1

* EA Credit 3.2: Continuous Existing Building Commissioning: Maintenance in LEED-EB Pilot Draft

**Intent**

Ensure that the building's systems are continuously commissioned and maintained appropriately so that they go on delivering target building performance goals over the long term.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

The building has an on-site facility engineering staff of 2 electricians and 2 HVAC technicians and as many as 45 different contractors that are dedicated to the continuous commissioning, maintenance, efficient and safe operation of the facility. JohnsonDiversey has in place planned service contracts to maintain major equipment and complex systems such as chillers, boilers, building automation controls, etc.

Routine inspections of the building and the equipment are used to determine maintenance repair requirements and Maximo, a computerized maintenance management system is used to process work orders and requests. This system provides a scheduled preventive maintenance program that insures that all of the building systems and equipment are functioning properly and catalogs inspections of the equipment in the system.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain their current building system commissioning activities and maintenance to ensure continued target building performance goals over the long term and to support ongoing recertification under LEED-EB.

# *Energy & Atmosphere*

## **Credit 3.3**: Building Operation & Maintenance: Building Systems Monitoring*

Points Available: 1

*EA Credit 3.1 Continuous Existing Building Commissioning and Maintenance: IEQ Monitoring in LEED-EB Pilot Draft

**Intent**

Support appropriate operation and maintenance of building systems so that they continue to deliver target building performance goals over the long term.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

JohnsonDiversey uses Johnson Controls Metasys, a computerized building automation system, to monitor and control all building HVAC equipment. The automation system includes controls and sensors for the heating, cooling, humidity control, lighting, and safety systems. These points are continuously monitored, and alarm parameters have been established to indicate when conditions are beyond their normal operating limits. Trend and totalization logs are used to determine when equipment is in need of adjustment or repair and to keep operating conditions at their peak.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the actions needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain their current building system commissioning activities and maintenance to ensure continued target building performance goals over the long term and to support ongoing recertification under LEED-EB.

# *Energy & Atmosphere*

## **Credit 5.1-5.3:** Performance Measurement: Enhanced Metering*

Points Available: 1-3

*Credit 5.1-5.3: Measurement & Verification under LEED-EB Pilot Version

**Intent**

Demonstrate the ongoing accountability and optimization of building energy and water consumption performance over time and add incentives for additional energy reduction.

**Status:** Earned 2 points

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 cost |

**Measures Supporting Achievement**

JohnsonDiversey, Inc. Global Headquarters employs a Johnson Controls Metasys building automation system that monitors and measures building electric use, cooling tower water use, air distribution static pressures and ventilation air volumes, chiller efficiency, cooling load, variable frequency drives operation, and with recently installed CO2 sensors, the CO2 levels within the building.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain their current building system monitoring efforts via the Metasys system to track system operation and to support ongoing recertification under LEED-EB.

# *Materials & Resources*

## **Prerequisite 1.1**: Source Reduction and Waste Management - Waste Stream Audit

Required

**Status:** Earned

**Intent**

Establish minimum source reduction and recycling program elements, and quantify current waste stream production volume.

**Economic Data***

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

*See MR Credit 5.1-5.3 on page 34 for economic data related to occupant recycling

**Measures Supporting Achievement**

JohnsonDiversey has established an extensive waste management program that integrates employee awareness, waste management staff involvement and building interior design/redesign to promote and facilitate recycling.

Waste Audit Results (Annual Waste Generation)

| | |
|---|---|
| Waste - Landfill | |
| Garbage | 208,000 lbs. |
| Waste - Recycled | |
| Cardboard | 74,800 lbs |
| Paper | 116,480 lbs |
| Commingle | 5,200 lbs |
| | |
| **Total Waste Stream** | **404,480 lbs** |
| **Total Recycled** | **196,480 lbs** |
| **% Recycled** | **49%** |

**Challenges & Solutions for Achievement**

Accurately measuring recycling and waste volumes allowed JohnsonDiversey to better understand their waste generation footprint. Company management was pleased to discover that over 50% of waste from the facility was already being recycled.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans continued tracking and recording of all key measures of waste volume, as well as ongoing efforts to encourage employee participation in the recycling programs presently available.

# *Materials & Resources*

## **Prerequisite 1.2:** Source Reduction and Waste Management - Storage & Collection of Recyclables

Required


**Intent**

Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

**Status:** Earned

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

*See MR Credit 5.1-5.3 on page 32 for economic data related to occupant recycling

**Measures Supporting Achievement**

JohnsonDiversey has developed recycling information and instructional forms for employees. The recycling policy lists the materials to be recycled by employees in the Headquarters building. A recycling card was created and distributed to all employees in the building. This card provides information on what to recycle, what not to recycle, where to take recyclables, and whom to contact with questions.

There are 24 recycling areas for recycling commingles (cans, glass, and plastic) and paper located throughout the facility. The custodial staff collects the recycled items from all 24 recycling areas and places it all in larger main recycling bins in a loading dock area. There is a paper recycling bin in every workstation in the facility.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain existing programs to improve employee awareness and encourage employees to participate fully in company recycling efforts to support ongoing recertification under LEED-EB.

# *Materials & Resources*

## **Prerequisite 2:** Toxic Materials Source Reduction – Reduced Mercury in Light Bulbs*

Required

* Prerequisite 1.3: Waste Management: Mercury Reduction in Lighting

**Status:** Earned

**Intent**

Establish a source reduction program to reduce creation of waste and a recycling program to reduce waste stream.

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ <0.01 cost |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 cost |

**Measures Supporting Achievement**

Although there previously was no policy in place, JohnsonDiversey, Inc. has for the past five years predominantly purchased 32W T-8 Alto lamps from Phillips. These particular lamps have a mercury content of 18.6ppm, which is under the limit of 25.0ppm. The annual overall average mercury content of the lamps in the facility is 18.72ppm, which is also below the 25ppm limit. A policy has been established to maintain low mercury in lighting on an on-going basis.

**Challenges & Solutions for Achievement**

Inventorying existing fixtures and bulbs represented the most significant challenge for this Credit. JohnsonDiversey already used bulbs that allowed them to meet the Prerequisite standard – the challenge lay in the legwork and time required to identify and record each fixture in the facility and the type of bulb employed. A facilities staff employee toured the building and hand-counted fixtures.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to continue to emphasize the purchase of low-mercury content lamps and to maintain an overall average mercury content appropriate to support ongoing recertification under LEED-EB. The policy also included requirements for lamp recycling.

# *Materials & Resources*

## **Credit 1.1-1.2:** Construction, Demolition and Renovation Waste Management*

Points Available: 1-2

*MR Credit 2: Construction Waste Management under LEED-EB Pilot Version

**Intent**

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

JohnsonDiversey has adopted a construction waste management policy that requires that staff or contractors recycle and/or salvage at least 30% (by weight) of any construction, demolition and land clearing waste (if applicable). This policy is considered to be in effect for all construction projects within the building.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to adhere to the construction waste policy for all construction projects within the facility and to seek new opportunities for reducing construction waste.

# *Materials & Resources*

## **Credit 2.1-2.5:** Optimize Use of Alternative Materials*

Points Available: 1-5

*MR Credit 3-7: Resource Reuse; Recycled Content; Local/Regional Materials; Rapidly Renewable Materials; and Certified Wood under LEED-EB Pilot Version

**Status: Earned 4 points**

**Intent**

Reduce the environmental impacts of the materials acquired for use in the operations and maintenance of buildings and in the upgrading of building services.

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ 0.02 savings |
| Life Cycle Net Impact / $ft^2$: | $ 0.17 savings |

**Measures Supporting Achievement**

JohnsonDiversey has established and adopted purchasing policies that target the use of alternative materials. For all construction projects within the building where materials needs can be met with alternative materials, JohnsonDiversey has specified the percentage of the total materials that will be met by alternative materials. The policies cover salvaged materials use, recycled content, local/regional materials, and certified wood. These policies are adhered to on all construction projects.

**Challenges & Solutions for Achievement**

JohnsonDiversey met with construction partners to ensure that meeting these requirements was feasible for the type of construction projects they regularly undertake. As this policy went into effect, JohnsonDiversey challenged suppliers to help achieve their goals.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to adhere to the alternative materials policies for all projects where the scope designates a need for materials that can be met with alternative materials. JohnsonDiversey will monitor performance related to the policies and seek new opportunities for using alternative materials.

# *Materials & Resources*

## **Credit 5.1-5.3:** Occupant Recycling*****

Points Available: 3

*MR Credit 8.1-8.3: Occupant Recycling under LEED-EB Pilot Version

**Intent**

Facilitate the reduction of waste and toxins generated by building occupants and building operations that is hauled to and disposed of in landfills.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ 0.02 savings |
| Life Cycle Net Impact / $ft^2$: | $ 0.17 savings |

**Measures Supporting Achievement**

JohnsonDiversey has developed and provides employees with recycling information and instructional forms. The recycling policy lists the materials to be recycled by employees in the JDGH building. A recycling card was created and distributed to all employees in the building. This card provides information on what to recycle, what not to recycle, where to take recyclables, and who to contact with questions.

There are 24 recycling areas for recycling commingles (cans, glass, and plastic) and paper located throughout the facility. The custodial staff collects the recycled items from all 24 recycling areas and places it all in larger main recycling bins in a loading dock area. There is a paper recycling bin in every workstation in the facility.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to continue to seek opportunities to facilitate occupant recycling by improving occupant awareness. JohnsonDiversey will monitor performance related to this policy to support recertification in LEED-EB.

# *Indoor Environmental Quality*

## **Prerequisite 1:** Outside Air Introduction & Exhaust Systems*
Required

*Prerequisite 1: Minimum IAQ Performance under LEED-EB Pilot Version.

**Intent**

Establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in buildings, thus contributing to the health and well-being of the occupants.

**Status:** Earned

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

The original design ventilation rates for the JohnsonDiversey Global Headquarters HVAC systems all exceed the 10 CFM per person minimum of outside air and the minimum required 20 CFM per person to meet ASHRAE 62-1999. A comprehensive Technical Air Balance (TAB), that was last performed on the building HVAC systems during its construction and commissioning in 1997, verified the delivery of OA ventilation rates that meet or exceed design rates. The ongoing preventative maintenance program assures and validates the operational and functional performance of all HVAC systems.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to ensure that ongoing preventive maintenance programs are maintained to validate the performance of all HVAC systems. JohnsonDiversey will monitor and record performance data related to these systems to support recertification in LEED-EB.

# *Indoor Environmental Quality*

## **Prerequisite 2:** Environmental Tobacco Smoke (ETS) Control
Required

**Intent**

Prevent or minimize exposure of building occupants, indoor surfaces and systems to Environmental Tobacco Smoke (ETS).

**Status:** Earned

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.01 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.01 cost |

**Measures Supporting Achievement**

JohnsonDiversey maintains a designated smoking room in the facility that has exhaust ventilation dedicated to serving only the smoking room and labs. The system is supplied with 100% outside air, and there is no recirculation. There is a minimum of 1600 cubic feet per minute of exhaust from the smoking room, resulting in 48 air changes per hour - exceeding ASHRAE 129-1997 for smoking rooms.

**Challenges & Solutions for Achievement**

JohnsonDiversey's facility is not a ”no-smoking” building. The company maintains one 12 x 12' smoking room for employees and guests. The challenge for JohnsonDiversey in meeting this Prerequisite was in identifying a consultant who could reliably test the level of air change in compliance with ASHRAE 129 requirements.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to monitor and periodically test the level of air change in the company smoking room to support recertification in LEED-EB.

# *Indoor Environmental Quality*

## **Prerequisite 3**: Asbestos Removal or Encapsulation

Required

**Intent**

Reduce the potential exposure of building occupants to asbestos and prevent associated harmful effects of asbestos in existing buildings.

**Status:** Earned

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

The JohnsonDiversey Global Headquarters building was constructed in 1997, and no materials containing asbestos are present.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

No further actions will be required to achieve this Prerequisite in the future.

# *Indoor Environmental Quality*

## **Credit 1:** Outdoor Air Delivery Monitoring*****

Points Available: 1

*IEQ Credit1: Carbon Dioxide ($CO_2$) Monitoring under LEED-EB Pilot Version

**Intent**

Provide capacity for ventilation system monitoring to help sustain long-term occupant comfort and well-being.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.05 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.05 |

**Measures Supporting Achievement**

JohnsonDiversey has recently completed a green building performance contract with Johnson Controls that included the installation of $CO_2$ sensors in the mixed air plenums at all major air handling systems, as well as in select occupied spaces in the buildings. The occupied spaces monitored are representative of areas in the building that may experience fresh air delivery or ventilation mixing difficulties during certain occupancy patterns and/or periods of the year. The $CO_2$ sensors are tied into the building automation system and have initially been set at 530 ppm above ambient. When sensors exceed the allowable set point, the building automation systems alarm alerts building operators so that they can address the conditions.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to continue to monitor $CO_2$ levels in both mixed air plenums of major air handling systems as well as selected occupied spaces of the buildings to support recertification in LEED-EB.

# *Indoor Environmental Quality*

## **Credit 2:** Increased Ventilation* **

Points Available: 1

*IEQ Credit 2: Ventilation Effectiveness under LEED-EB Pilot Version
** The pilot version of this Credit focused on the effectiveness of ventilation systems, but this proved difficult to test and document. For this reason, the post-pilot version of the Credit focuses on increasing the volume of airflow through ventilation systems. This case study example is based on the pilot version of LEED-EB.

**Intent**

Provide additional outdoor air ventilation to improve indoor air quality for improved occupant comfort, well-being and productivity.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

The JohnsonDiversey Global Headquarters was designed with an under-floor HVAC system that supplies ventilation air to the employee's desk surface. This is accomplished with a Johnson Controls Personal Environment Module that takes supply air from the raised floor space and moves it to the work surface for maximum benefit to the employee.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey continues to operate and maintain an under-floor HVAC system to ensure effective delivery of fresh air for building occupants and to support recertification in LEED-EB.

# *Indoor Environmental Quality*

## **Credit 3:** Construction IAQ Management Plan

Points Available: 1

**Intent**

Prevent indoor air quality problems resulting from any construction/renovation projects in order to help sustain the comfort and well-being of construction workers and building occupants.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ <0.01 |
| Life Cycle Net Impact / $ft^2$: | $ 0.09 |

**Measures Supporting Achievement**

JohnsonDiversey has adopted a written construction IAQ monitoring policy. The policy and plan address the protection of the ventilation system components during construction and cleanup of contaminated components after construction is complete. These construction-related IAQ procedures are now included in the pre-construction and construction project specifications for all projects. The plan includes SMACNA Guidelines that recommend control in five areas: HVAC protection, source control, pathway interruption, housekeeping, and scheduling. The second focus of the plan provides an additional point for a sixth type of measure, building flushout. For each project, contractors will be required to review the applicability of each control measure and include those that apply in the final IAQ Management plan.

**Challenges & Solutions for Achievement**

JohnsonDiversey initially approached this Credit by seeking to measure the indoor air quality of a given space against criteria pollutants. Unfortunately, the costs of appropriate sensors and analytical equipment quickly became prohibitive (over $10,000). A two-week flushout period is being tested while less expensive equipment is identified.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey is continuing to seek affordable analytical devices while testing the effectiveness and cost of the two-week flush out period.

# *Indoor Environmental Quality*

## **Credit 5.1:** Indoor Chemical and Pollutant Source Control: Non-Cleaning System – Reduce Particulates in Air Distribution*

Points Available: 1

*IEQ Credit 5.1: Green Housekeeping – Entryway Systems under LEED-EB Pilot Version

**Intent**

Reduce exposure of building occupants and maintenance personnel to potentially hazardous particle contaminants, which adversely impact air quality, health, building finishes, building systems and the environment.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.02 savings |
| Life Cycle Net Impact / $ft^2$: | $ 0.25 savings |

**Measures Supporting Achievement**

All high volume entryways into all JohnsonDiversey buildings are provided with permanent walk-off systems and are regularly maintained and cleaned as a function of housekeeping programmed maintenance. All entryways are protected, either seasonally or as required by weather, with walk-off mats to limit dirt and allergens in the building. Exterior entryway areas are kept clean and clear of materials that could be dragged into the buidling.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to ensure that all entryway systems are maintained as required to support recertification in LEED-EB.

# *Indoor Environmental Quality*

## **Credit 5.2:** Indoor Chemical and Pollutant Source Control: Non-Cleaning – Isolation of High Volume Copying/Print Rooms/Fax Stations*

Points Available: 1

*Credit 5.3: Green Housekeeping – High Volume Copying


**Intent**

Reduce exposure of building occupants to potentially hazardous chemicals that adversely impact air quality, building finishes and systems, and the environment.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

High volume copying, print rooms and fax stations are required to have special ventilation system features to mitigate the risks that chemicals or other agents from those areas might contaminate the ventilation and supply air distribution system. JohnsonDiversey facilities have a dedicated exhaust air management system for venting high volume copying, print rooms and fax stations.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievement**

JohnsonDiversey intends to maintain specially ventilated mixing areas for high volume copying, print rooms, and fax stations to support recertification in LEED-EB.

# *Indoor Environmental Quality*

## **Credit 6.1-6.2:** Controllability of Systems: Lighting, Temperature & Ventilation

Points Available: 2

**Intent**

Provide a high level of temperature, ventilation and lighting control by individual occupants or specific groups in multi-occupant spaces (e.g. classrooms or conference areas) to promote the productivity, comforts and well-being of building occupants.

**Status:** Earned 2 points

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ 0.05 savings |
| Life Cycle Net Impact / $ft^2$: | $ 0.56 savings |

**Measures Supporting Achievement**

Personal environment modules (PEMs) are installed in 93% of the total building office areas. These modules provide individual control of temperature, air flow, lighting, and acoustics at each workstation.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain the personal environment modulus in its offices to maintain a high level of occupant comfort and to support ongoing recertification of this building.

# *Indoor Environmental Quality*

## **Credit 7.1:** Thermal Comfort- Compliance

Points Available: 1


**Intent**

Provide a comfortable thermal environment that supports the productivity and well-being of building occupants.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

The JohnsonDiversey Global Headquarters building is equipped with temperature and humidity sensors in the discharge air plenums at all major air handling systems as well as in select occupied spaces in the building. The occupied spaces monitored are representative of areas in the building that may experience temperature and/or humidity difficulties during certain occupancy patterns and /or periods of the year. The temperature and humidity sensors are tied into the building automation system, are monitored constantly, and compared to pre-determined set points. When sensors exceed the allowable set point, the building automation system alarm alerts building operators so that they can address the conditions. These set points are in the range of 68 – 74 degrees F in winter and 73 – 79 degrees F in summer.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain the permanent monitoring system for temperature and humidity in the discharge air plenums at all major air handling systems as well as in select occupied spaces in the building. JohnsonDiversey plans to gradually increase, over time, the number of occupied spaces that have permanent monitoring systems for temperature and humidity, These actions will maintain a high level of occupant comfort and support ongoing recertification of this building.

# *Indoor Environmental Quality*

## **Credit 7.2:** Thermal Comfort- Permanent Monitoring System

Points Available: 1

**Intent**

Provide a comfortable thermal environment that supports the productivity and well-being of building occupants.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

The JohnsonDiversey Global Headquarters building is equipped with temperature and humidity sensors in the discharge air plenums at all major air handling systems as well as in select occupied spaces in the building. The occupied spaces monitored are representative of areas in the building that may experience temperature and/or humidity difficulties during certain occupancy patterns and /or period of the year. The temperature and humidity sensors are tied into the building automation system and are monitored constantly in comparison to pre-determined set points. When sensors exceed the allowable set point, the building automation system notifies building operators so that they can address the conditions. These set points are in the follow range, 68 – 74 degrees F in the winter and 73 – 79 degrees F in the summer.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the actions needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain the permanent monitoring system for temperature and humidity to maintain a high level of occupant comfort and to support ongoing recertification of this building.

# *Indoor Environmental Quality*

## **Credit 8.1-8.2:** Daylighting & Views: Daylighting*

Points Available: 2

*IEQ Credit 8.3: Daylight & Views – Daylight under LEED-EB Pilot Version

**Intent**

Provide a connection between indoor spaces and the outdoor environment through introduction of sunlight and views into the occupied areas of the building.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 |

**Measures Supporting Achievement**

The JohnsonDiversey Global Headquarters building was designed to provide a connection between indoor occupied spaces and the outdoor environment through the introduction of indirect and direct sunlight. The building uses south and west exposure window walls for the open office area along with light shelves to enable the natural light to penetrate deeper into the space. There is also a central atrium with a skylight and light scopes that provide natural light to the inner portions of the open office area. JohnsonDiversey estimates that 97% of the occupied space is at or above the 2% requirement for this Credit.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to maintain the building features that provide daylighting in the building, which supports ongoing recertification of this building.

# *Indoor Environmental Quality*

## **Credit 8.3 - 8.4:** Daylighting & Views – Views*

Points Available: 2

*IEQ Credit 8.1-8.2: Daylight & views – Views under LEED-EB Pilot Version

**Intent**

Provide a connection between indoor spaces and the outdoor environment through introduction of sunlight and views into the occupied areas of the building.

**Status:** Earned 2 points

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ <0.01 |

**Measures Supporting Achievement**

The JohnsonDiversey building was designed to maximize the line of sight to windows. The existing configuration provides line of sight from occupied areas for 81% of the building area.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

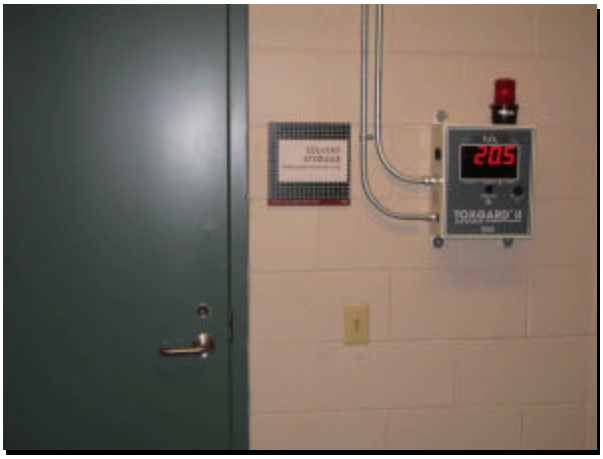
JohnsonDiversey plans to maintain the building features that provide line of site views from the inside of the building and to look for any opportunities created by facility remodeling to increase the amount of building interior space with line of site views. These actions will support ongoing recertification of this building.

# *Indoor Environmental Quality*

## **Credit 10.2:** Green Cleaning: Isolation of Janitorial Closets*

Points Available: 1

* Credit 5.2: Green Housekeeping – Mixing Areas under LEED-EB Pilot Version




**Intent**

Reduce exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particle contaminants, which adversely impact air quality, health, building finishes, building systems, the environment and reduce deposition of contaminants in the buildings.

**Status:** Earned 1 point

**Economic Data**

| | | |
|---|---|---|
| Initial Cost / $ft^2$: | $ | 0.00 |
| Annual Net Impact / $ft^2$: | $ | 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ | 0.00 |

**Measures Supporting Achievement**

Water and chemical concentrate mixing areas are required to have special ventilation system features to mitigate the risk that chemicals or other agents from those areas might contaminate the ventilation and supply air distribution system. JohnsonDiversey facilities have a dedicated exhaust air management system for venting water and chemical concentrate mixing areas.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to maintain specially ventilated mixing areas to support recertification in LEED-EB.

# *Indoor Environmental Quality*

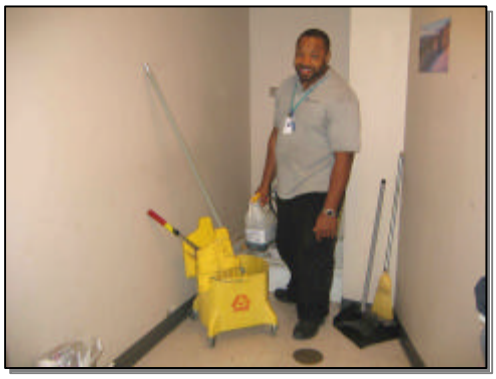
## **Credit 10.3:** Green Cleaning: Low Environmental Impact Cleaning Policy*

Points Available: 1

*IEQ Credit 5.4: Green Housekeeping: Low-Impact Cleaning and Housekeeping, IEQ Credit 5.5: Low Environmental Impact Disposable Products, and IEQ Credit 5.7 Green Housekeeping: Outdoor Chemical Storage of the LEED-EB Pilot Version all fall under Credit 10.3 in the post-pilot version of LEED-EB.

**Intent**

Reduce exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particle contaminants, which adversely impact air quality, health, building finishes, building systems, the environment, and reduce deposition of contaminants in the buildings.



**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ <0.01 |
| Annual Net Impact / $ft^2$: | $ 0.02 savings |
| Life Cycle Net Impact / $ft^2$: | $ 0.55 savings |

**Measures Supporting Achievement**

JohnsonDiversey has developed and adopted a Low Environmental Impact Cleaning Fluid and Housekeeping Policy. The intent of the policy is to avoid exposing building occupants and maintenance personnel to potentially hazardous chemical, biological and particle contaminants, and to balance these needs with the cost and quality of the managed systems to provide a sustainable approach to housekeeping. As part of this policy, JohnsonDiversey ensures that cleaning workers are properly trained; concentrated products from closed dispensing systems are used; records are kept; programs are managed to minimize the environmental impact of cleaning; and only low environmental impact housekeeping chemicals and disposable products are purchased and used in the facility. The policy also requires the use of environmentally preferable cleaning equipment.

**Challenges & Solutions for Achievement**

Outside of some new record-keeping requirements, no significant challenges were experienced in implementing the action need to earn this credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to continue to adhere to the Low Environmental Impact Cleaning Fluid and Housekeeping Policy to support recertification in LEED-EB.

# *Indoor Environmental Quality*

## **Credit 10.4-10.5:** Green Cleaning: Low Environmental Impact Pest Management Policy*

Points Available: 2

*IEQ Credit 5.6: Green Housekeeping: Low Environmental Impact Pest Management Policy under LEED-EB Pilot Version

**Intent**

Reduce exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particle contaminants, which adversely impact air quality, health, building finishes, building systems, the environment, and reduced deposition of contaminants in the buildings.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.00 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.00 |

**Measures Supporting Achievement**

JohnsonDiversey has developed and adopted a Low Environmental Impact Cleaning Fluid and Housekeeping Policy which includes a plan for integrated pest management. The integrated pest management plan is intended to manage insect and pest issues while avoiding exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particle contaminants. The program relies extensively on overall facility hygiene, and a preference for managing pest through the use of baiting and traps instead of the application of pesticides.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit. Going forward, the biggest challenge will be effective communications to building occupants as required in the standard.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey intends to continue to adhere to the Low Environmental Impact Cleaning Fluid and Housekeeping Policy to support recertification in LEED-EB.

# *Innovation in Upgrades, Operations and Maintenance*

## Credit 2: LEED Accredited Professional

Points Available: 1

**Intent**

To support and encourage the design integration required by a LEED for Existing Buildings Green Building project and to streamline the application and certification process.

**Status:** Earned 1 point

**Economic Data**

| | |
|---|---|
| Initial Cost / $ft^2$: | $ 0.07 |
| Annual Net Impact / $ft^2$: | $ 0.00 |
| Life Cycle Net Impact / $ft^2$: | $ 0.07 |

**Measures Supporting Achievement**

Jeff Furness, LEED AP, of Johnson Controls participated in the JohnsonDiversey Headquarters LEED-EB project development, documentation and certification application process.

**Challenges & Solutions for Achievement**

No significant challenges were experienced in implementing the action needed to earn this Credit.

**Planned Actions to Maintain and Increase Ongoing Performance Achievements**

JohnsonDiversey plans to continue using LEED-Accredited Professionals with experience in implementing LEED-EB to support ongoing recertification of this building